

Minimally invasive cantilever correction technique for adult spinal deformity using reduction percutaneous pedicle screw system -technical notes-

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Introduction and objective

Therapy for elderly adult spinal deformity is controversial due to some complications
Surgery or conservative?

Can MIS technique obtain balanced spinal alignment for elderly ASD patients?

The objective of this study is to introduce our surgical method and to evaluate 25 cases



Materials and Method

2015.10~2017.7

25 cases who were underwent correction surgery from thoracic to pelvis due to spinal global imbalance

Male 3 cases Female 22 cases, **Mean age 76 y.o.** (51~89)

Follow-up period : minimum 6 months (mean **13months**)

Schwab classification L 12 cases, N 13 cases

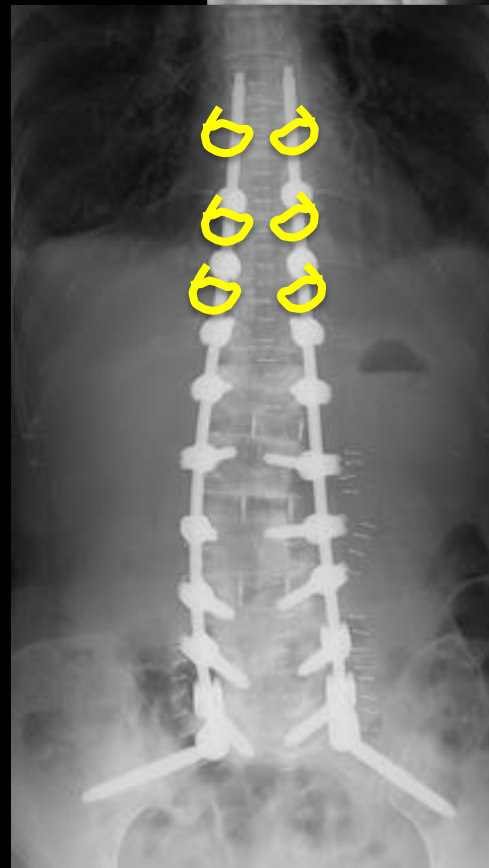
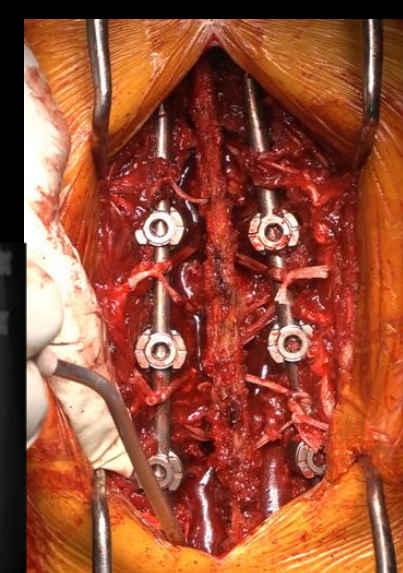
Degenerative kyphoscoliosis 20 cases

Kyphoscoliosis with vertebral compression fracture 3 cases

After posterior spinal fusion surgery 2 cases

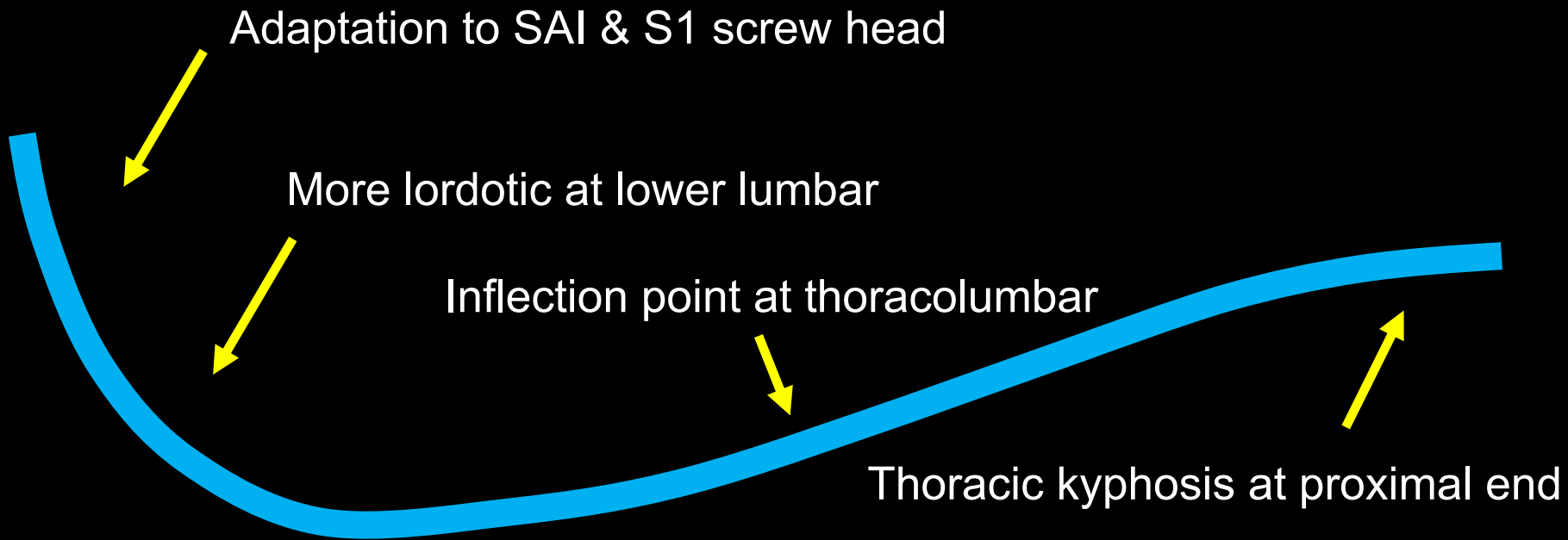
Our surgical method MIS Posterior Hybrid

- LIF (OLIF or XLIF®) at L1-5
- LIF corpectomy (X-Core 2®) for vertebral collapse
- L5/S TLIF
- **Without posterior osteotomy**
- SAI screw for pelvic fixation
- **L1-S1 PPS**
- 3 or more level **thoracic open Pedicle screw**
- One more cranial 3 level sublaminar taping (Yellow loop : Nespron®)



Rod shape: **Lordotic shape**

Rod insertion : **from caudal to cranial**



5.5mm diameter Ti-alloy

Caudal

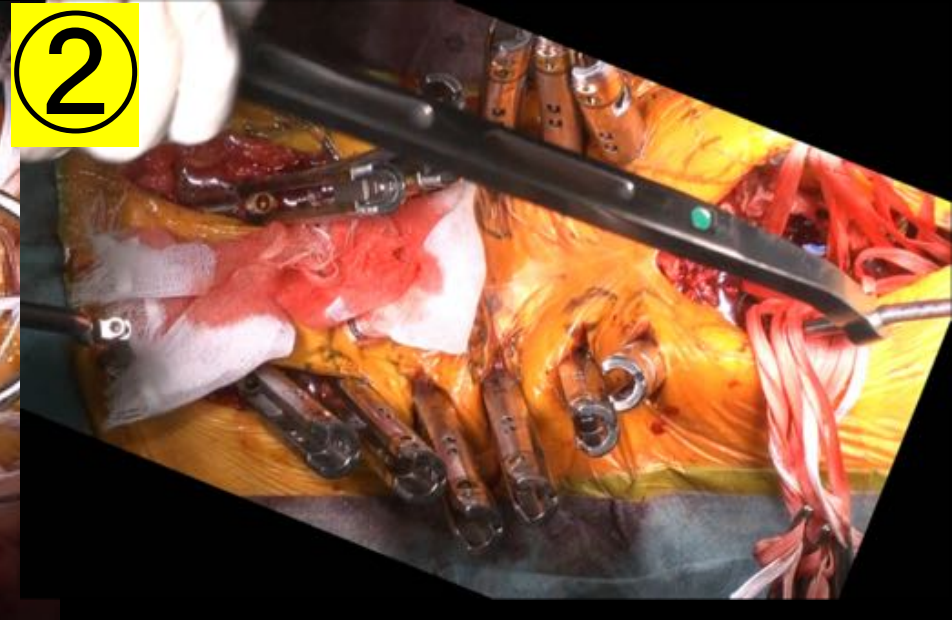
Intra-operative photo

Cranial

1



2



3



4

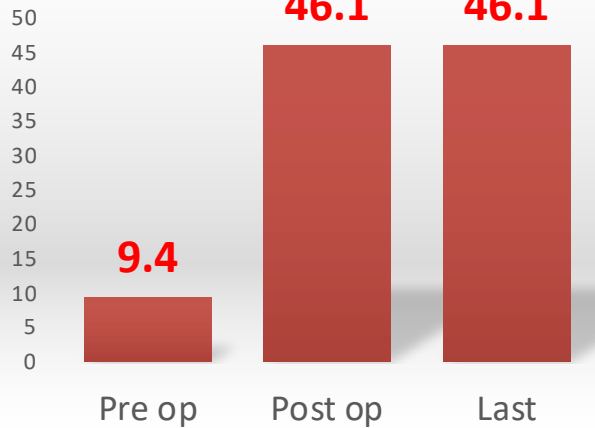


Case summary

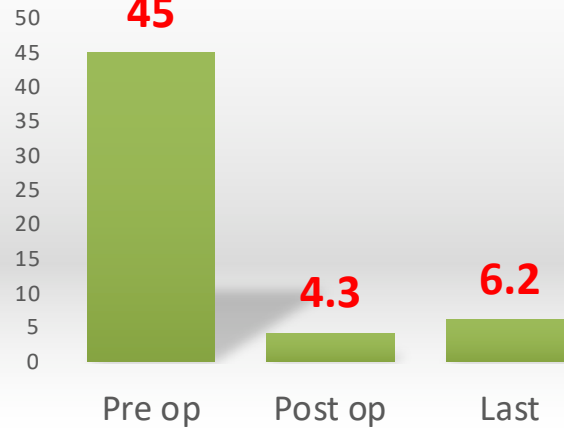
| | All cases 25 cases | LIF 22 cases | X-CORE 3 cases |
|--------------------------|-----------------------|-----------------|-------------------|
| Age | 76.5 | 75.9 | 80.7 |
| | | | |
| LIF fusion No. | 3.8 levels | 3.6 | 5.0 |
| LIF ope. time | 134 min | 121 | 225 |
| | | | |
| Posterior fusion No. | 10.0 levels | 9.9 | 10.3 |
| Posterior ope. time | 300 min | 302 | 283 |
| | | | |
| EBL (ant and post total) | 382 g | 387 | 344 |

Parameters in standing X-

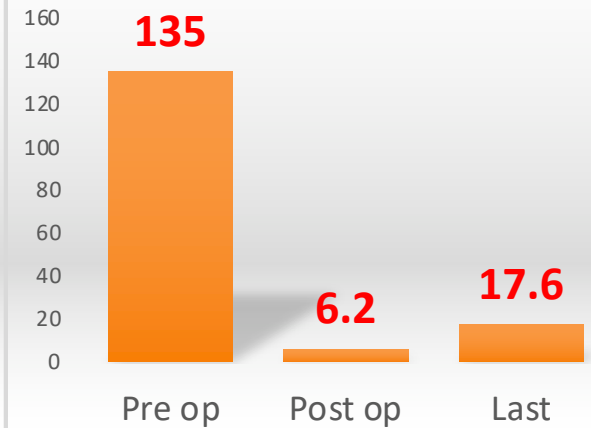
LL



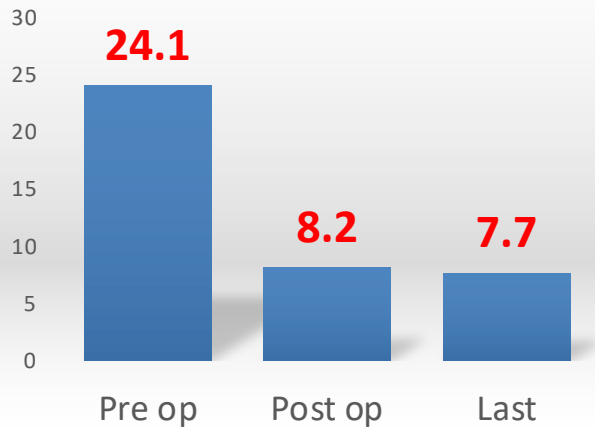
PI-LL



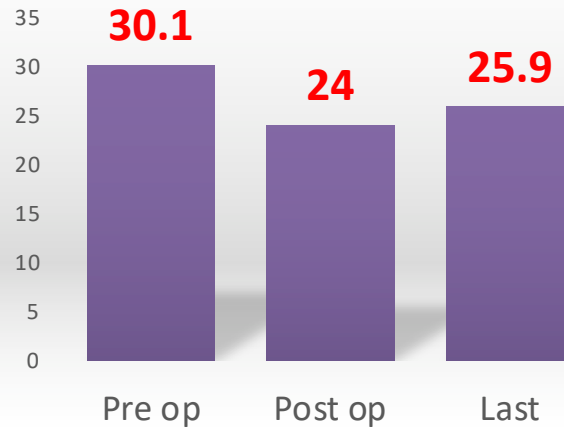
SVA



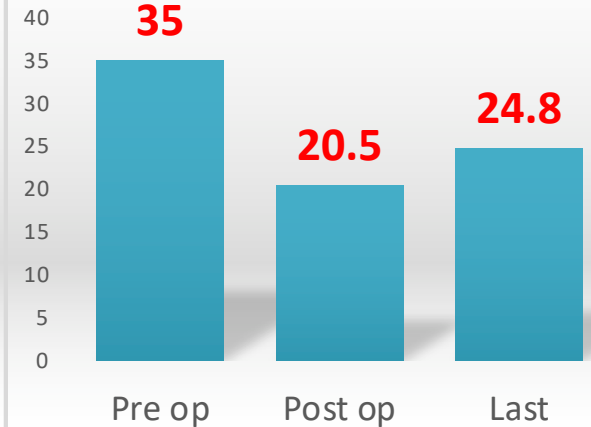
Cobb



CVA



PT



82 y.o. female Kyphoscoliosis

- Low back pain
- Gait disturbance
- GERD

L1/2/3/4 LIF 1h45m T9-Pelv Post. Fix. 5h35m
Bleeding 214g

Schwab L ++/++/++

Cobb 43→8°

SVA 181→-17mm

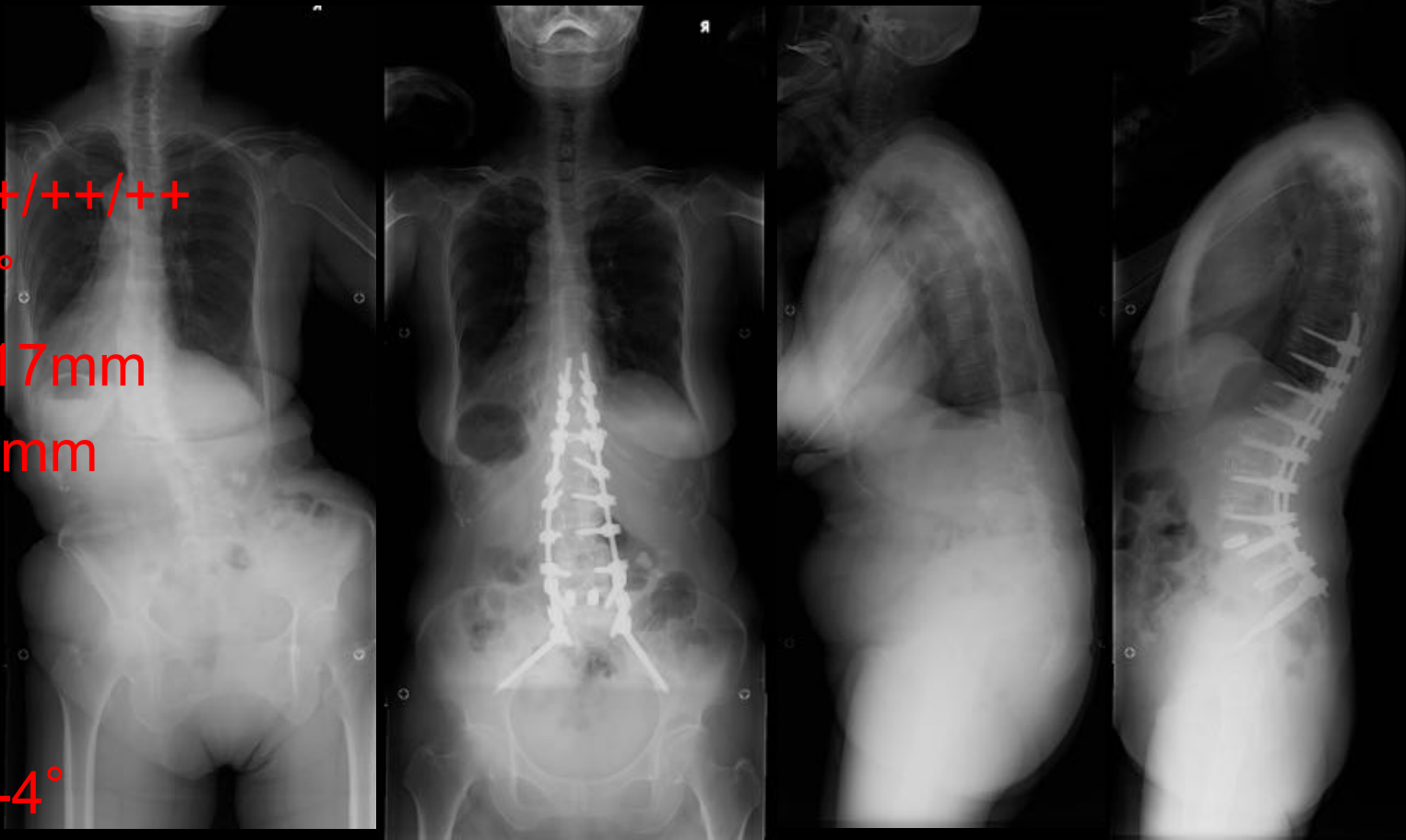
CVA 90→10mm

LL -8→70°

PT 42→21°

PI 66°

PI-LL 74 → -4°



Discussion

To gain LL by not only LIF but rod maneuver

Cantilever & extender sleeve

MIS correction technique

Average local angle

L1/2 3.5→8.3→11.7

L2/3 2.6→7.3→10.7

L3/4 2.8→7.9→12

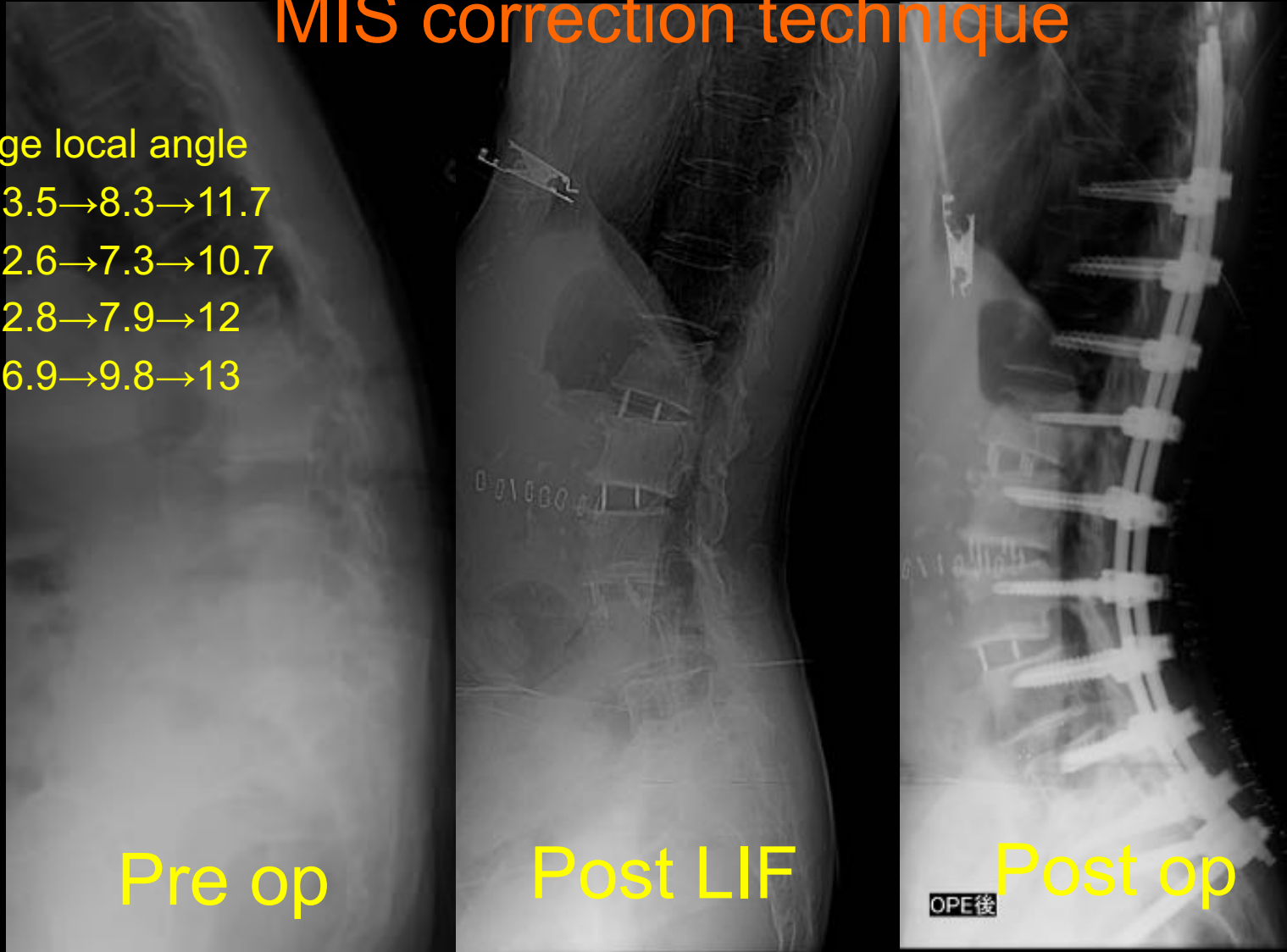
L4/5 6.9→9.8→13

Pre op

Post LIF

Post op

OPE後



Discussion

Is this MIS technique feasible for ASD?

LIF&PPS for ASD achieved insufficient correction in the previous literatures, but It is not described about correction technique

- LIF (&LIF corpectomy) = Ant. Release & Ant. Correction
- PPS =Post. cantilever correction

→This technique is feasible in most primary cases with ASD

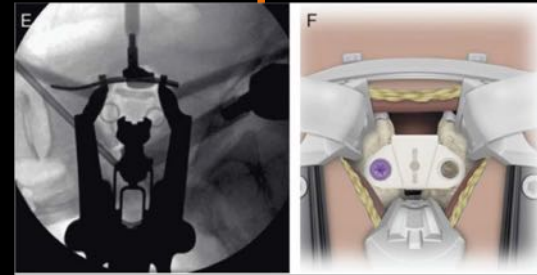
Problems of our MIS deformity technique

1, Less correction and correction loss of PT ?

- Need **more lordosis at lower lumbar spine**
 - ACR (Anterior column realignment)
 - OLIF51

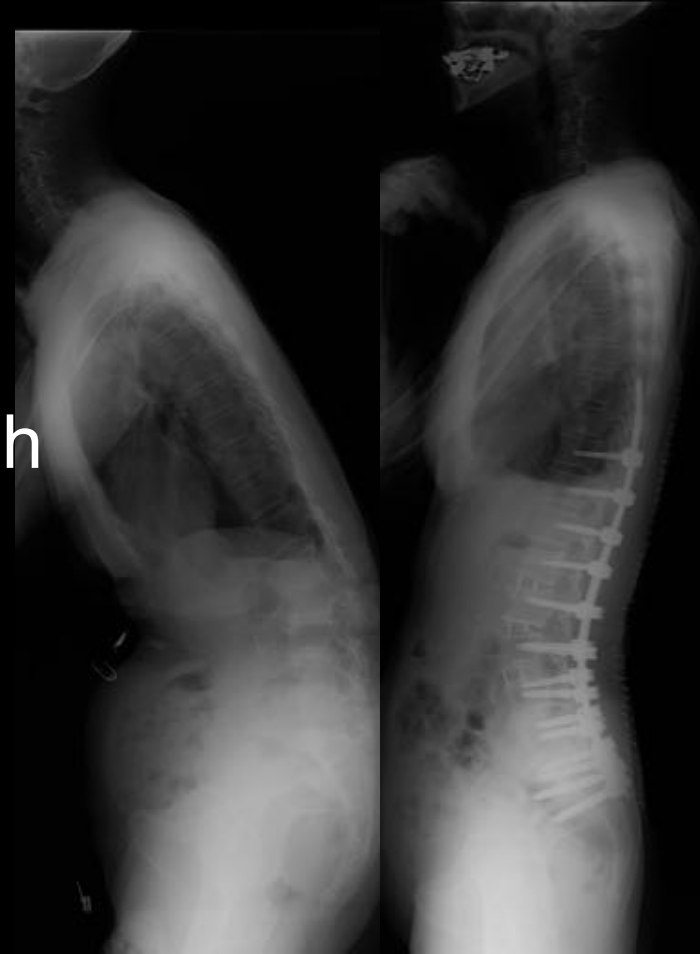
2, PJF rate is still high ?

- **All PPS Technique**



Conclusion

- We introduced MIS correction technique for patients with adult spinal deformity
- We had less invasive surgery for elderly patients and gained enough balanced spinal alignment
- It is important to gain LL by not only LIF but also MIS cantilever correction technique with PPS



COI Disclosure

The presenting author has no financial COI to disclose concerning the presentation.